

REMARKS

Claim 1 has been rejected by the Examiner under 35 U.S.C. 112, first paragraph, Failing to comply with the enable requirements. This rejection is respectively traverse.

As the Examiner will note, claim 1 as well as all of the remaining claims in the present application have been editorial amended to bring them into better compliance with US patent practice. Accordingly, it is believed that this rejection has been eliminated.

Claims 1-6 and 8-10 has been rejected by the Examiner under 35 U.S.C. 103 (a) as being unpatentable over Lee et al., US 2002/0100725A1 in view of Terry et al. US Patent 2,746,839. Claim 7 has been rejected by the Examiner under 35 U.S.C. 103 (a) as being unpatentable over Lee et al. in view of Terry et al. and further in view of Reneker, US patent 6,520,425. These rejections are respectively traversed.

The present invention is directed to a process of preparing a continuous filament composed of nano fibers which utilizes a plurality of process steps including spinning at least one polymer spinning dope through nozzles onto a collector surface of water or an organic solvent which has a conductive material disposed below the surface of the collector, applying a high voltage to the nozzles and the conductive material wherein the nano fibers spun onto the surface of the water or organic solvent are pressed, drawn, died and wound while being pulled by a rotary roller.

The Examiner relies upon the Lee et al. patent to allegedly show many of the process steps of the present invention. However, as noted by the Examiner and also as can be readily seen by referring to the Lee et al. patent, the reference patent contains many deficiencies which cannot be possibly be filled by the teachings of the Terry et al. patent without completely reconstructing the teachings of references in view of the Applicants own disclosure. Thus, for example, the Terry et al. patent does not teach spinning the fibers onto the surface of water or organic solvent as a collector. In fact as shown in paragraph [0042], the collector utilized in Lee et al. patent is not water or an organic solvent but rather a cumulation plate is placed on a conductive collector in order to accumulate the polymer web material. Also, since the cumulation plate is placed on the conductive collector, the impression is that the cumulation

plate and conductive collector are in juxtaposition with respect to each other which is to be distinguished from the present invention wherein the conductive material is disposed below the collector surface (that is the surface of the water or organic solvent) a predetermined distance, such as, for example, a distance of 0.01-200mm or a distance of 5 to 50mm as recited in claims 3 and 4 of the present application, respectively.

In further distinctions of the present invention from the Lee et al. patent, the reference patent does not show that the fibers which are caught between the surface of water or an organic solvent are pressed, drawn, dried and wound by a roller. Furthermore, there is no recognition that the distance (d) from one end of the dropping spot of the nano fibers, to the initial point where the nano fibers are pulled by the rotary roller is more than 1cm. As noted on page 5 of the present application, if the distance (d) is less than 1cm, the spun nano fibers are pulled up in a state where they have not sufficiently coagulated, thereby making a production of a continuous filament very difficult.

Still further, there's no recognition in the Lee et al. patent that the conductive material (5), can be a metal plate or metal powder disposed at a distance (h) from the surface of the water or organic solvent of 0.01 to 200 nm or preferably, 5 to 50 nm. If this distance (h) is too small, a spun nano fiber is placed in direct contact with the surface of the conductive material and thereafter cannot be pulled away by the rotary roller, thereby making the process difficult. If the distance (h) is too large, the voltage applied to the conductive material (5) is not transferred well to the surface of the water or organic solvent, thereby making the collective state of the nano fiber very poor.

From the above discussion, it is clear that the Lee et al. patent suffers from many deficiencies which, in affect, render the Lee et al. patent totally ineffective as a primary reference in rejecting the claims of the present application. In any event, the Examiner has turned to the Terry et al. patent in an attempt to solve these deficiencies. However, in combining references to reject claims under 35 U.S.C. § 103, there must be some suggestion in either the primary or secondary references as to why it would be obvious to one skilled in the art to modify the teachings of primary reference with the teachings of the secondary reference. In the present situation, the secondary reference, that is, the Terry et al patent does not even appear to be

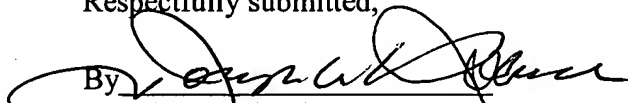
remotely related to the process of manufacturing nano fibers utilizing voltage applied to spinning nozzles and collector surfaces. In fact, the Terry et al. patent appears to be only directed to a very common type of thread spinning process in which a plastic material is merely spun through an orifice into a coagulating bath wherein the spinning is effected by a differential pressure upon the solution of the plastic material between opposed faces of a plate. Thus, the similarity between the method of spinning shape filaments of plastic material as defined in Terry et al. patent is materially different from the electrospinning method defined in the Lee et al. patent. Thus, one skilled in the art with both the Lee et al. and Terry et al. patents before him cannot possibly arrive at the Applicants inventive contribution without dissecting bits and pieces from each of the references and recombining them in an attempt to arrive at a process of preparing a continuous filament of nano fibers as defined by the present invention. Even if, arguendo, it would be possible to combine the references as suggested by the Examiner, said combination would still not suggest the present invention since the specific methods steps as recited in the claims cannot be found in either the Lee et al. or Terry et al. patents. Thus, none of the references relied upon by the Examiner disclosed are even remotely suggest such additional features as the distance from the surface of the water or organic solvent to the top of the surface of the conductive material, the distance (d) from one end of the dropping spot of the nano fibers to the initial point where the nano fibers are pulled by the rotary roller; the angle formed between the nano fibers collected on the surface of the water or organic solvent in the undrawn filament, and the like. Accordingly, in view of all of the distinctions pointed out hereinabove, it is believe that the rejection of the claims under 35 U.S.C. § 103 (a) over Lee et al. in view of Terry et al. is untenable and thus reconsideration thereof is respectfully requested.

Claims 7 has been rejected by the Examiner under 35 U.S.C § 103 (a) as being unpatentable over Lee et al. in view of Terry et al. and further in view of Reneker. In view of the many deficiency pointed out hereinabove in connection with the Lee et al, and the Terry et al. patents, it is believed that the further reliance upon the Reneker patent cannot possibly suggest the subject matter of claim 7 which, because of it's dependency upon claim 1, contains all of the limitations of claim 1.

Accordingly, in view of the above amendments and remarks reconsideration of the rejections and allowance of all the claims in the present application are respectfully requested.

Dated: August 15, 2006

Respectfully submitted,

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